

SEQUENCE LISTING

<110> ReproCELL, Inc.

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<140> none

10 <141> 2002-11-08

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<170> PatentIn version 3.1

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Val Ser Leu Glu Ala Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln

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220

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235

240

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Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu

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Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln

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365

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Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala

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Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gln Phe

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Pro Val Val Val Ile Val His Gly Ser Gln Asp His Asn Ala Thr Ala

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Glu Asn Leu Pro Gly Trp Asn Tyr Thr Phe Trp Gln Trp Phe Asp Gly

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Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile

595 600 605

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610 615 620

Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Pro Glu Arg Asn Leu

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	Asn Leu Val Phe Leu Ala Gin Lys Leu Phe Asn Asn Ser Ser Ser His	
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15	ctg gag gac tac agt ggc ctg tct gtg tcc tgg tcc cag ttc aac agg	1680
	Leu Glu Asp Tyr Ser Gly Leu Ser Val Ser Trp Ser Gin Phe Asn Arg	
	545 550 555 560	
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	Glu Asn Leu Pro Gly Arg Asn Tyr Thr Phe Trp Gin Trp Phe Asp Gly	
	565 570 575	
25	gtg atg gaa gtg tta aaa aaa cat ctc aag cct cat tgg aat gat ggg	1776
	Val Met Glu Val Leu Lys Lys His Leu Lys Pro His Trp Asn Asp Gly	
	580 585 590	
	gcc att ttg ggg ttt gta aac aag caa cag gcc cat gac cta ctc att	1824
	Ala Ile Leu Gly Phe Val Asn Lys Gin Gin Ala His Asp Leu Leu Ile	

	595	600	605	
	aac aag cca gat ggg acc ttc ctc ctg aga ttc agt gac tca gaa att			1872
	Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile			
5	610	615	620	
	ggc ggc atc acc att gct tgg aag ttt gat tct cag gaa aga atg ttt			1920
	Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Gln Glu Arg Met Phe			
	625	630	635	640
10				
	tgg aat ctg atg cct ttt acc acc aga gac ttc tcc att cgg tcc cta			1968
	Trp Asn Leu Met Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu			
	645	650	655	
15	gcc gac cgc ttg gga gac ttg aat tac ctt atc tac gtg ttt cct gat			2016
	Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp			
	660	665	670	
	cgg cca aaa gat gaa gta tac tcc aaa tac tac aca cca gtt ccc tgc			2064
20	Arg Pro Lys Asp Glu Val Tyr Ser Lys Tyr Tyr Thr Pro Val Pro Cys			
	675	680	685	
	gag tct gct act gct aaa gct gtt gat gga tac gtg aag cca cag atc			2112
	Glu Ser Ala Thr Ala Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile			
25	690	695	700	

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Lys Gin Val Val Pro Glu Phe Val Asn Ala Ser Ala Asp Ala Gly Gly
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Gly Ser Ala Thr Tyr Met Asp Gin Ala Pro Ser Pro Ala Val Cys Pro
725 730 735

cag gct cac tat aac atg tac cca cag aac cct gac tca gtc ctt gac 2256
10 Gin Ala His Tyr Asn Met Tyr Pro Gin Asn Pro Asp Ser Val Leu Asp
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acc gat ggg gac ttc gat ctg gag gac aca atg gac gta gcg cgg cgt 2304
Thr Asp Gly Asp Phe Asp Leu Glu Asp Thr Met Asp Val Ala Arg Arg
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gtg gag gag ctc ctg ggc cgg cca atg gac agt cag tgg atc ccg cac 2352
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Ala Gin Ser
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30

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Tyr Leu Ser Gin Trp Ile Glu Ser Gin Ala Trp Asp Ser Val Asp Leu

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40

45

20 Asp Asn Pro Gin Glu Asn Ile Lys Ala Thr Gin Leu Leu Glu Gly Leu

50

55

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25 Val Gin Glu Leu Gin Lys Lys Ala Glu His Gin Val Gly Glu Asp Gly

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70

75

80

Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gin Leu Gin Asn

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Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile

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10 Leu Tyr Asn Glu Gin Arg Leu Val Arg Glu Ala Asn Asn Gly Ser Ser

115 120 125

Pro Ala Gly Ser Leu Ala Asp Ala Met Ser Gin Lys His Leu Gin Ile

15 130 135 140

Asn Gin Thr Phe Glu Glu Leu Arg Leu Val Thr Gin Asp Thr Glu Asn

145 150 155 160

20

Glu Leu Lys Lys Leu Gin Gin Thr Gin Glu Tyr Phe Ile Ile Gin Tyr

165 170 175

25

Gin Glu Ser Leu Arg Ile Gin Ala Gin Phe Gly Pro Leu Ala Gin Leu

180

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Ser Pro Gin Glu Arg Leu Ser Arg Glu Thr Ala Leu Gin Gin Lys Gin

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Val Ser Leu Glu Ala Trp Leu Gin Arg Glu Ala Gin Thr Leu Gin Gin

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10

Tyr Arg Val Glu Leu Ala Glu Lys His Gin Lys Thr Leu Gin Leu Leu

225

230

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240

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Arg Lys Gin Gin Thr Ile Ile Leu Asp Asp Glu Leu Ile Gin Trp Lys

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20 Arg Arg Gin Gin Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu

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Asp Val Leu Gin Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gin

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Asn Arg Gln Gln Ile Arg Arg Ala Glu His Leu Cys Gln Gln Leu Pro

290 295 300

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Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile

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10 Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys

325 330 335

Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val

15 340 345 350

Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln

355 360 365

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370 375 380

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Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe

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Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ser Asp Arg Arg Gly Ala

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Glu Ser Val Thr Glu Glu Lys Phe Thr Ile Leu Phe Glu Ser Gln Phe

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Ser Val Gly Gly Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu

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Pro Val Val Val Ile Val His Gly Ser Gln Asp Asn Asn Ala Thr Ala

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Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe

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Ala Val Pro Asp Lys Val Leu Trp Pro Gin Leu Cys Glu Ala Leu Asn

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Met Lys Phe Lys Ala Glu Val Gin Ser Asn Arg Gly Leu Thr Lys Glu

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520

525

10 Asn Leu Val Phe Leu Ala Gin Lys Leu Phe Asn Asn Ser Ser Ser His

530

535

540

Leu Glu Asp Tyr Ser Gly Leu Ser Val Ser Trp Ser Gin Phe Asn Arg

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555

560

Glu Asn Leu Pro Gly Arg Asn Tyr Thr Phe Trp Gin Trp Phe Asp Gly

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570

575

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Val Met Glu Val Leu Lys Lys His Leu Lys Pro His Trp Asn Asp Gly

580

585

590

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Ala Ile Leu Gly Phe Val Asn Lys Gin Gin Ala His Asp Leu Leu Ile

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Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile

5 610

615

620

Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Gln Glu Arg Met Phe

625

630

635

640

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Trp Asn Leu Met Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu

645

650

655

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Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp

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665

670

20 Arg Pro Lys Asp Glu Val Tyr Ser Lys Tyr Thr Pro Val Pro Cys

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680

685

Glu Ser Ala Thr Ala Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile

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700

Lys Gin Val Val Pro Glu Phe Val Asn Ala Ser Ala Asp Ala Gly Gly

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715

720

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Gly Ser Ala Thr Tyr Met Asp Gin Ala Pro Ser Pro Ala Val Cys Pro

725

730

735

10 Gin Ala His Tyr Asn Met Tyr Pro Gin Asn Pro Asp Ser Val Leu Asp

740

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15 Thr Asp Gly Asp Phe Asp Leu Glu Asp Thr Met Asp Val Ala Arg Arg

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775

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Ala Gin Ser

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15 cag atg caa gtg ttg tat ggg cag cat ttc ccc atc gag gtc cgg cac 96

Gln Met Gln Val Leu Tyr Gln His Phe Pro Ile Glu Val Arg His

20 25 30

65 tac ctg gcc cag tgg atc gag agc cag ccg tgg gat gct att gac ttg 144

20 Tyr Leu Ala Gln Trp Ile Glu Ser Gln Pro Trp Asp Ala Ile Asp Leu

35 40 45

77 gat aat ccc cag gac cga ggt cag gcc acc caa ctc ctg gag ggc ctg 192

Asp Asn Pro Gln Asp Arg Gly Gln Ala Thr Gln Leu Leu Glu Gly Leu

25 50 55 60

gtg cag gag ctg cag aag aag gcg gag cac cag gtg ggg gaa gat ggg 240
Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly
65 70 75 80

5 ttt ttg ctg aag atc aag ctg ggg cac tat gcc aca cag ctc cag aac 288
Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Asn
85 90 95

10 acg tat gac cgc tgt ccc atg gag ctg gtt cgc tgt atc cgt cac att 336
Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile
100 105 110

15 ctg tac aac gaa cag agg ctg gtt cgc gaa gcc aac aat tgc agc tcc 384
Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Cys Ser Ser
115 120 125

20 cct gct ggt gtc ctg gtt gac gcc atg tcc cag aag cac ctt cag atc 432
Pro Ala Gly Val Leu Val Asp Ala Met Ser Gln Lys His Leu Gln Ile
130 135 140

25 gag ctg aag aag ctg cag cag acc caa gag tac ttc atc atc cag tac 528
Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr
145 150 155 160

	165	170	175	
	cag gag agc ctg cgg atc caa gct cag ttt gcc cag ctg ggc cag ctg			576
	Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu			
5	180	185	190	
	aac ccc cag gag cgc atg agc agg gag acg gcc ctc cag cag aag caa			624
	Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln			
	195	200	205	
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	gtg tcc ctg gag acc tgg ctg cag cga gag gca cag aca ctg cag cag			672
	Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln			
	210	215	220	
15	tac cga gtg gag ctg gct gag aag cac cag aag acc ctg cag ctg ctg			720
	Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu			
	225	230	235	240
	cgg aag cag cag acc atc atc ctg gac gac gag ctg atc cag tgg aag			768
20	Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys			
	245	250	255	
	cgg aga cag cag ctg gcc ggg aac ggg ggt ccc ccc gag ggc agc ctg			816
	Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu			
25	260	265	270	

gac gtg ctg cag tcc tgg tgt gag aag ctg gcc gag atc atc tgg cag 864
Asp Val Leu Gin Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gin
275 280 285

5 aac cgg cag cag atc cgc agg gct gag cac ctg tgc cag cag ctg ccc 912
Asn Arg Gin Gin Ile Arg Arg Ala Glu His Leu Cys Gin Gin Leu Pro
290 295 300

atc cca ggc ccc gtg gag gag atg ctg gct gag gtc aac gcc acc atc 960
10 Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile
305 310 315 320

acg gac atc atc tca gct ctg gtc acc agc acg ttc atc atc gag aag 1008
Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys
15 325 330 335

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Gin Pro Pro Gin Val Leu Lys Thr Gin Thr Lys Phe Ala Ala Thr Val
340 345 350

20 cgc ctg ctg gtg ggg gga aag ctg aat gtg cac atg aac ccc ccg cag 1104
Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gin
355 360 365

25 gtg aag gcg acc atc atc agc gag cag cag gcc aag tcc ctg ctc aag 1152
Val Lys Ala Thr Ile Ile Ser Glu Gin Gin Ala Lys Ser Leu Leu Lys

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	Asn Glu Asn Thr Arg Asn Glu Cys Ser Gly Glu Ile Leu Asn Asn Cys			
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	tgc gtc atg gag tac cac cag gcc act ggc acg ctc agc gcc cac ttc			1248
	Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe			
	405	410	415	
10	aga aac atg tca ctg aaa aga atc aag cgc gcc gac agg cgt ggt gca			1296
	Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala			
	420	425	430	
15	gag tcg gtg acg gag gag aag ttc aca gtc ctg ttt gag tct cag ttc			1344
	Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gln Phe			
	435	440	445	
	agc gtt ggc agc aac gag ctg gtg ttc cag gtg aag acc ctg tcc ctc			1392
20	Ser Val Gly Ser Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu			
	450	455	460	
	cct gtg gtc gtt atc gtc cat ggc agc cag gac cac aat gct act gcc			1440
	Pro Val Val Val Ile Val His Gly Ser Gln Asp His Asn Ala Thr Ala			
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acc gtg ctg tgg gac aat gcc ttt gct gag ccg ggc agg gtg cca ttt 1488
Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe
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5 gct gtg cct gac aag gtg ctg tgg ccg cag ctg tgt gaa gcg ctc aac 1536
Ala Val Pro Asp Lys Val Leu Trp Pro Gln Leu Cys Glu Ala Leu Asn
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atg aaa ttc aag gct gaa gta cag agc aac cgg ggc ttg acc aaa gag 1584
10 Met Lys Phe Lys Ala Glu Val Gln Ser Asn Arg Gly Leu Thr Lys Glu
515 520 525

aac ctc gtg ttc ctg gca cag aaa ctg ttc aac atc agc agc aac cac 1632
Asn Leu Val Phe Leu Ala Gln Lys Leu Phe Asn Ile Ser Ser Asn His
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ctc gag gac tac aac agc atg tct gtg tcc tgg tcc cag ttc aac cgg 1680
Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gln Phe Asn Arg
545 550 555 560

20 gag aac ttg ccc ggc tgg aac tac acc ttc tgg cag tgg ttc gac ggg 1728
Glu Asn Leu Pro Gly Trp Asn Tyr Thr Phe Trp Gln Trp Phe Asp Gly
565 570 575

25 gtg atg gag gtg ctg aag aag cac cat aag ccc cat tgg aat gat ggg 1776
Val Met Glu Val Leu Lys Lys His His Lys Pro His Trp Asn Asp Gly

	580	585	590	
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	Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile			
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	aac aag ccg gac ggg acc ttc ctg ctg cgc ttc agt gac tcg gaa atc 1872			
	Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile			
	610	615	620	
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	Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Pro Asp Arg Asn Leu			
	625	630	635	640
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	Trp Asn Leu Lys Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu			
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	gcc gac cgg ctg ggg gac ctg aac tac ctt atc tac gtg ttc cca gac 2016			
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	675	680	685	

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Glu Phe Val Asn Ala Ser Thr Asp Ala Gly Ala Ser Ala Thr Tyr Met
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725 730 735

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755 760 765

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15 Gin Met Gin Val Leu Tyr Gly Gin His Phe Pro Pro Ile Glu Val Arg His

20

25

30

20 Tyr Leu Ala Gin Trp Ile Glu Ser Gin Pro Trp Asp Ala Ile Asp Leu

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45

25 Asp Asn Pro Gin Asp Arg Gly Gin Ala Thr Gin Leu Leu Glu Gly Leu

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Val Gin Glu Leu Gin Lys Lys Ala Glu His Gin Val Gin Val Gly Glu Asp Gly
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5 Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gin Leu Gin Asn
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Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile
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Leu Tyr Asn Glu Gin Arg Leu Val Arg Glu Ala Asn Asn Cys Ser Ser
115 120 125

15

Pro Ala Gly Val Leu Val Asp Ala Met Ser Gin Lys His Leu Gin Ile
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Asn Gin Arg Phe Glu Glu Leu Arg Leu Ile Thr Gin Asp Thr Glu Asn
145 150 155 160

25 Glu Leu Lys Lys Leu Gin Gin Thr Gin Glu Tyr Phe Ile Ile Gin Tyr
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Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu

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Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln

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Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln

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15 Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu

225 230 235 240

Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys

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Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu

260 265 270

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Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys

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Gin Pro Pro Gin Val Leu Lys Thr Gin Thr Lys Phe Ala Ala Thr Val

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Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gin

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Val Lys Ala Thr Ile Ile Ser Glu Gin Gin Ala Lys Ser Leu Leu Lys

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Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe

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Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala

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20 Ser Val Gly Ser Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu

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Pro Val Val Val Ile Val His Gly Ser Gln Asp His Asn Ala Thr Ala

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Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe

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Ala Val Pro Asp Lys Val Leu Trp Pro Gin Leu Cys Glu Ala Leu Asn

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Asn Leu Val Phe Leu Ala Gin Lys Leu Phe Asn Ile Ser Ser Asn His

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Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gin Phe Asn Arg

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Arg Pro Lys Asp Glu Val Phe Ala Lys Tyr Tyr Thr Pro Val Leu Ala

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710

715

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730

735

Tyr Pro Pro Asn Pro Asp Pro Val Leu Asp Gin Asp Gly Glu Phe Asp

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740

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750

Leu Asp Glu Ser Met Asp Val Ala Arg His Val Glu Glu Leu Leu Arg

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Gln Met Gln Ala Leu Tyr Gly Gln His Phe Pro Ile Glu Val Arg His

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Tyr Leu Ser Gln Trp Ile Glu Ser Gln Ala Trp Asp Ser Ile Asp Leu

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Asp Asn Pro Gln Glu Asn Ile Lys Ala Thr Gln Leu Leu Glu Gly Leu
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Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly
65 70 75 80

10 ttt ttg ctg aag atc aag ctg ggg cac tat gcc aca cag ctc cag agc 288
Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Ser
85 90 95

15 acg tac gac cgc tgc ccc atg gag ctg gtt cgc tgt atc cgg cac att 336
Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile
100 105 110

20 ctg tac aac gaa cag agg ctg gtt cgc gaa gcc aac aac ggc agc tct 384
Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Gly Ser Ser
115 120 125

25 cca gct gga agt ctt gct gac gcc atg tcc cag aag cac ctt cag atc 432
Pro Ala Gly Ser Leu Ala Asp Ala Met Ser Gln Lys His Leu Gln Ile
130 135 140

25 aac caa acg ttt gag gag ctg cgc ctg atc aca cag gac acg gag aac 480
Asn Gln Thr Phe Glu Glu Leu Arg Leu Ile Thr Gln Asp Thr Glu Asn

145	150	155	160	
gag ctg aag aag ctg cag cag acc caa gag tac ttc atc atc cag tac				528
Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr				
5	165	170	175	
cag gag agc ctg cgg atc caa gct cag ttt gcc cag ctg gga cag ctg				576
Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu				
180 185 190				
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aac ccc cag gag cgc atg agc agg gag acg gcc ctc cag cag aag caa				624
Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln				
195	200	205		
15	210	215	220	
gtg tcc ctg gag acc tgg ctg cag cga gag gca cag aca ctg cag cag				672
Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln				
225 230 235 240				
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tac cga gtg gag ctg gct gag aag cac cag aag acc ctg cag ctg ctg				720
Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu				
225	230	235	240	
25	245	250	255	
cgg aag cag cag acc atc atc ctg gac gac gag ctg atc cag tgg aag				768
Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys				

	cgg aga cag cag ctg gcc ggg aac ggg ggt ccc ccc gag ggc agc ctg	816		
	Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu			
	260	265	270	
5	gac gtg ctg cag tcc tgg tgt gag aag ctg gcc gag atc atc tgg cag	864		
	Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln			
	275	280	285	
	aat cgg cag cag atc cgc agg gct gag cac ctg tgc cag cag ctg ccc	912		
10	Asn Arg Gln Gln Ile Arg Arg Ala Glu His Leu Cys Gln Gln Leu Pro			
	290	295	300	
	atc cca ggc ccc gtg gag gag atg ctg gct gag gtc aac gcc acc atc	960		
	Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile			
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	acg gac atc atc tca gcc ctg gtc acc agc acg ttc atc atc gag aag	1008		
	Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys			
	325	330	335	
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	cag cct cct cag gtc ctg aag acc cag acc aag ttt gcg gcc act gtg	1056		
	Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val			
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25	cgc ctg ctg gtg ggg ggg aag ctg aat gtg cac atg aac ccc ccc cag	1104		
	Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln			

	355	360	365	
	gtg aag gcg acc atc atc agc gag cag cag gcc aag tcc ctg ctc aag			1152
	Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys			
5	370	375	380	
	aat gag aac acc cgc aat gat tac agc ggc gag atc ctg aac aac tgt			1200
	Asn Glu Asn Thr Arg Asn Asp Tyr Ser Gly Glu Ile Leu Asn Asn Cys			
	385	390	395	400
10	1248			
	tgc gtc atg gag tac cac cag gcc act ggc acg ctc agc gcc cac ttc			
	Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe			
	405	410	415	
15	1296			
	aga aac atg tcc ctg aaa cga atc aag aga tct gac cgc cgt ggt gca			
	Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ser Asp Arg Arg Gly Ala			
	420	425	430	
	1344			
	gag tca gta acg gaa gag aag ttc acg atc ctg ttt gac tca cag ttc			
20	Glu Ser Val Thr Glu Glu Lys Phe Thr Ile Leu Phe Asp Ser Gln Phe			
	435	440	445	
	1392			
	agc gtc ggt gga aac gag ctg gtc ttt caa gtc aag acc ttg tcg ctc			
	Ser Val Gly Gly Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu			
25	450	455	460	

ccg gtg gtg gtg att gtt cac ggc agc cag gac aac aat gcc aca gcc 1440
Pro Val Val Val Ile Val His Gly Ser Gln Asp Asn Asn Ala Thr Ala
465 470 475 480

5 act gtc ctc tgg gac aac gcc ttt gca gag cct ggc agg gtg cca ttt 1488
Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe
485 490 495

gcc gtg cct gac aag gtg ctg tgg ccg cag ctg tgt gaa gcg ctc aac 1536
10 Ala Val Pro Asp Lys Val Leu Trp Pro Gln Leu Cys Glu Ala Leu Asn
500 505 510

atg aaa ttc aag gct gaa gta cag agc aac cgg ggc ttg acc aag gag 1584
Met Lys Phe Lys Ala Glu Val Gln Ser Asn Arg Gly Leu Thr Lys Glu
15 515 520 525

aac ctc gtg ttc ctg gca cag aaa ctg ttc aac atc agc agc aac cac 1632
Asn Leu Val Phe Leu Ala Gln Lys Leu Phe Asn Ile Ser Ser Asn His
530 535 540

20 ctc gag gac tac aac agc atg tcc gtg tcc tgg tcc cag ttc aac cgg 1680
Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gln Phe Asn Arg
545 550 555 560

25 gag aat ttg cca gga cgg aat tac act ttc tgg cag tgg ttt gat ggc 1728
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	Val Met Glu Val Leu Lys Lys His Leu Lys Pro His Trp Asn Asp Gly			
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	gct atc ctg ggt ttc gtg aac aag caa cag gcc cac gac ctg ctc atc			1824
	Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile			
	595	600	605	
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	aac aag ccg gac ggg acc ttc ctg ctg cgc ttc agc gac tcg gaa atc			1872
	Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile			
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15	ggg ggc atc acc att gct tgg aag ttt gac tct cag gag aga atg ttt			1920
	Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Gln Glu Arg Met Phe			
	625	630	635	640
	tgg aat ctg atg cct ttt acc act aga gac ttc tct atc cgg tcc ctc			1968
20	Trp Asn Leu Met Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu			
	645	650	655	
	gct gac cgc ctg ggg gac ctg aat tac ctc ata tat gtg ttt cct gat			2016
	Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp			
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cgg cca aag gat gaa gta tat tct aag tac tac aca ccg gtc ccc tgt 2064
Arg Pro Lys Asp Glu Val Tyr Ser Lys Tyr Tyr Thr Pro Val Pro Cys
675 680 685

5 gag ccc gca act gcg aaa gca gct gac gga tac gtg aag cca cag atc 2112
Glu Pro Ala Thr Ala Lys Ala Ala Asp Gly Tyr Val Lys Pro Gin Ile
690 695 700

aag cag gtg gtc ccc gag ttt gca aat gca tcc aca gat gct ggg agt 2160
10 Lys Gin Val Val Pro Glu Phe Ala Asn Ala Ser Thr Asp Ala Gly Ser
705 710 715 720

gac gcc acc tac atg gat cag gct cct tcc cca gtc gtg tgc cct cag 2208
Gly Ala Thr Tyr Met Asp Gin Ala Pro Ser Pro Val Val Cys Pro Gin
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gct cac tac aac atg tac cca ccc aac ccg gac tcc gtc ctt gat acc 2256
Ala His Tyr Asn Met Tyr Pro Pro Asn Pro Asp Ser Val Leu Asp Thr
740 745 750

20 gat ggg gac ttc gat ctg gaa gac acg atg gac gtg gcg cgg cgc gtg 2304
Asp Gly Asp Phe Asp Leu Glu Asp Thr Met Asp Val Ala Arg Arg Val
755 760 765

25 gaa gag ctc tta ggc cgg ccc atg gac agt cag tgg atc cct cac gca 2352
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775

780

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2361

Gln Ser

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30 Tyr Leu Ser Gln Trp Ile Glu Ser Gln Ala Trp Asp Ser Ile Asp Leu

35 40 45

25

Asp Asn Pro Gln Glu Asn Ile Lys Ala Thr Gln Leu Leu Glu Gly Leu

50 55 60

5 Val Gln Glu Leu Gln Lys Ala Glu His Gln Val Gly Glu Asp Gly

65 70 75 80

Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Ser

10 85 90 95

Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile

100 105 110

15

Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Gly Ser Ser

115 120 125

20

Pro Ala Gly Ser Leu Ala Asp Ala Met Ser Gln Lys His Leu Gln Ile

130 135 140

25 Asn Gln Thr Phe Glu Glu Leu Arg Leu Ile Thr Gln Asp Thr Glu Asn

145 150 155 160

Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr

165

170

175

5

Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu

180

185

190

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Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln

195

200

205

15 Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln

210

215

220

20 Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu

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230

235

240

25 Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys

245

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Asn Arg Gin Gin Ile Arg Arg Ala Glu His Leu Cys Gin Gin Leu Pro

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Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile

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Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys

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25 Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gin

355 360 365

Val Lys Ala Thr Ile Ile Ser Glu Gin Gin Ala Lys Ser Leu Leu Lys

370 375 380

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Asn Glu Asn Thr Arg Asn Asp Tyr Ser Gly Glu Ile Leu Asn Asn Cys

385 390 395 400

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Cys Val Met Glu Tyr His Gin Ala Thr Gly Thr Leu Ser Ala His Phe

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15 Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ser Asp Arg Arg Gly Ala

420 425 430

Glu Ser Val Thr Glu Glu Lys Phe Thr Ile Leu Phe Asp Ser Gin Phe

20 435 440 445

Ser Val Gly Gly Asn Glu Leu Val Phe Gin Val Lys Thr Leu Ser Leu

450 455 460

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Pro Val Val Val Ile Val His Gly Ser Gln Asp Asn Asn Ala Thr Ala

465 470 475 480

5 Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe

485 490 495

Ala Val Pro Asp Lys Val Leu Trp Pro Gln Leu Cys Glu Ala Leu Asn

10 500 505 510

Met Lys Phe Lys Ala Glu Val Gln Ser Asn Arg Gly Leu Thr Lys Glu

515 520 525

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Asn Leu Val Phe Leu Ala Gln Lys Leu Phe Asn Ile Ser Ser Asn His

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Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gln Phe Asn Arg

545 550 555 560

25 Glu Asn Leu Pro Gly Arg Asn Tyr Thr Phe Trp Gln Trp Phe Asp Gly

565 570 575

Val Met Glu Val Leu Lys Lys His Leu Lys Pro His Trp Asn Asp Gly

580 585 590

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Ala Ile Leu Gly Phe Val Asn Lys Gln Gln Ala His Asp Leu Leu Ile

595 600 605

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610 615 620

15 Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Gln Glu Arg Met Phe

625 630 635 640

Trp Asn Leu Met Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu

20 645 650 655

Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp

660 665 670

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Arg Pro Lys Asp Glu Val Tyr Ser Lys Tyr Tyr Thr Pro Val Pro Cys

675

680

685

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690

695

700

Lys Gln Val Val Pro Glu Phe Ala Asn Ala Ser Thr Asp Ala Gly Ser

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710

715

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Gly Ala Thr Tyr Met Asp Gln Ala Pro Ser Pro Val Val Cys Pro Gln

725

730

735

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Ala His Tyr Asn Met Tyr Pro Pro Asn Pro Asp Ser Val Leu Asp Thr

740

745

750

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Asp Gly Asp Phe Asp Leu Glu Asp Thr Met Asp Val Ala Arg Arg Val

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Gln Met Gln Val Leu Tyr Gln His Phe Pro Ile Glu Val Arg His

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	tac ctg gcc cag tgg atc gag agc cag ccg tgg gat gct att gac ttg			144
	Tyr Leu Ala Gln Trp Ile Glu Ser Gln Pro Trp Asp Ala Ile Asp Leu			
5	35	40	45	
	gat aat ccc cag gac cga ggt cag gcc acc caa ctc ctg gag ggc ctg			192
	Asp Asn Pro Gln Asp Arg Gly Gln Ala Thr Gln Leu Leu Glu Gly Leu			
	50	55	60	
10				
	gtg cag gag ctg cag aag aag gcg gag cac cag gtg ggg gaa gat ggg			240
	Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly			
65	70	75	80	
15	ttt ttg ctg aag atc aag ctg ggg cac tat gcc aca cag ctc cag aac			288
	Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Asn			
	85	90	95	
20				
	acg tat gac cgc tgt ccc atg gag ctg gtt cgc tgt atc cgt cac att			336
	Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile			
	100	105	110	
25				
	ctg tac aac gaa cag agg ctg gtt cgc gaa gcc aac aat tgc agc tcc			384
	Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Cys Ser Ser			
	115	120	125	

cct gct ggt gtc ctg gtt gac gcc atg tcc cag aag cac ctt cag atc 432
Pro Ala Gly Val Leu Val Asp Ala Met Ser Gln Lys His Leu Gln Ile
130 135 140

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145 150 155 160

gag ctg aag aag ctg cag cag acc caa gag tac ttc atc atc cag tac 528
10 Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr
165 170 175

cag gag agc ctg cgg atc caa gct cag ttt gcc cag ctg ggc cag ctg 576
Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu
15 180 185 190

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210 215 220

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Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu

225	230	235	240	
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				Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys
5	245	250	255	
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				cgg aga cag cag ctg gcc ggg aac ggg ggt ccc ccc gag ggc agc ctg Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu
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	275	280	285	
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	290	295	300	
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	305	310	315	320
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5 cgc ctg ctg gtg ggg gga aag ctg aat gtg cac atg aac ccc ccg cag 1104
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355 360 365

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370 375 380

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Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe
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20 aga aac atg tca ctg aaa aga atc aag cgc gcc gac agg cgt ggt gca 1296
Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala
420 425 430

25 gag tcg gtg acg gag gag aag ttc aca gtc ctg ttt gag tct cag ttc 1344
Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gln Phe

435

440

445

agc gtt ggc agc aac gag ctg gtg ttc cag gtg aag acc ctg tcc ctc 1392
Ser Val Gly Ser Asn Glu Leu Val Phe Gin Val Lys Thr Leu Ser Leu

5 450 455 460

cct gtg gtc gtt atc gtc cat ggc agc cag gac cac aat gct act gcc 1440
Pro Val Val Val Ile Val His Gly Ser Gin Asp His Asn Ala Thr Ala

465 470 475 480

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acc gtg ctg tgg gac aat gcc ttt gct gag ccg ggc agg gtg cca ttt 1488
Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe

485 490 495

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Ala Val Pro Asp Lys Val Leu Trp Pro Gin Leu Cys Glu Ala Leu Asn

500 505 510

atg aaa ttc aag gct gaa gta cag agc aac cgg ggc ttg acc aaa gag 1584
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515 520 525

aac ctc gtg ttc ctg gca cag aaa ctg ttc aac atc agc agc aac cac 1632
Asn Leu Val Phe Leu Ala Gin Lys Leu Phe Asn Ile Ser Ser Asn His

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ctc gag gac tac aac agc atg tct gtg tcc tgg tcc cag ttc aac cgg 1680
Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gln Phe Asn Arg
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5 gag aac ttg ccc ggc tgg aac tac acc ttc tgg cag tgg ttc gac ggg 1728
Glu Asn Leu Pro Gly Trp Asn Tyr Thr Phe Trp Gln Trp Phe Asp Gly
565 570 575

gtg atg gag gtg ctg aag aag cac cat aag ccc cat tgg aat gat ggg 1776
10 Val Met Glu Val Leu Lys Lys His His Lys Pro His Trp Asn Asp Gly
580 585 590

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Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Pro Asp Arg Asn Leu
625 630 635 640

25 tgg aat ctg aag cca ttc acg acg cga gat ttc tcc att cgg tcc ctg 1968
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	675	680	685	
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	aaa gca gtt gac gga tac gtg aag cca cag atc aag caa gtg gtc cct			2112
	Lys Ala Val Asp Gly Tyr Val Lys Pro Gin Ile Lys Gin Val Val Pro			
	690	695	700	
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	Glu Phe Val Asn Ala Phe Thr Asp Ala Gly Ala Ser Ala Thr Tyr Met			
	705	710	715	720
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	gac cag gct cct tcc cca gtc gtg tgc cct caa cct cac tac aac atg			2208
	Asp Gin Ala Pro Ser Pro Val Val Cys Pro Gin Pro His Tyr Asn Met			
	725	730	735	
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	Tyr Pro Pro Asn Pro Asp Pro Val Leu Asp Gin Asp Gly Glu Phe Asp			
	740	745	750	

ctg gat gag agc atg gat gtt gcc agg cac gtg gaa gaa ctt tta cgc 2304

Leu Asp Glu Ser Met Asp Val Ala Arg His Val Glu Glu Leu Leu Arg

755

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10

15

Gln Met Gln Val Leu Tyr Gly Gln His Phe Pro Ile Glu Val Arg His

20

25

30

5

Tyr Leu Ala Gln Trp Ile Glu Ser Gln Pro Trp Asp Ala Ile Asp Leu

35

40

45

10 Asp Asn Pro Gln Asp Arg Gly Gln Ala Thr Gln Leu Leu Glu Gly Leu

50

55

60

Val Gln Glu Leu Gln Lys Lys Ala Glu His Gln Val Gly Glu Asp Gly

15

65

70

75

80

Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Asn

20

85

90

95

Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile

100

105

110

25

Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Cys Ser Ser

115 120 125

5 Pro Ala Gly Val Leu Val Asp Ala Met Ser Gln Lys His Leu Gln Ile

130 135 140

Asn Gln Arg Phe Glu Glu Leu Arg Leu Ile Thr Gln Asp Thr Glu Asn

10 145 150 155 160

Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr

165 170 175

15

Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu

180 185 190

20

Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln

195 200 205

25 Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln

210 215 220

Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu

225 230 235 240

5

Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys

245 250 255

10

Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu

260 265 270

15 Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln

275 280 285

Asn Arg Gln Gln Ile Arg Arg Ala Glu Arg Leu Cys Gln Gln Leu Pro

20 290 295 300

Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile

305 310 315 320

25

Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys

325 330 335

5 Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val

340 345 350

Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln

10 355 360 365

Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys

370 375 380

15

Asn Glu Asn Thr Arg Asn Glu Cys Ser Gly Glu Ile Leu Asn Asn Cys

385 390 395 400

20

Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe

405 410 415

25 Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala

420 425 430

Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gin Phe

435 440 445

5

Ser Val Gly Ser Asn Glu Leu Val Phe Gin Val Lys Thr Leu Ser Leu

450 455 460

10

Pro Val Val Val Ile Val His Gly Ser Gin Asp His Asn Ala Thr Ala

465 470 475 480

15 Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe

485 490 495

20 Ala Val Pro Asp Lys Val Leu Trp Pro Gin Leu Cys Glu Ala Leu Asn

500 505 510

25 Met Lys Phe Lys Ala Glu Val Gin Ser Asn Arg Gly Leu Thr Lys Glu

515 520 525

25

Asn Leu Val Phe Leu Ala Gin Lys Leu Phe Asn Ile Ser Ser Asn His

530 535 540 .

5 Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gin Phe Asn Arg

545 550 555 560

Glu Asn Leu Pro Gly Trp Asn Tyr Thr Phe Trp Gin Trp Phe Asp Gly

10 565 570 575

Val Met Glu Val Leu Lys Lys His His Lys Pro His Trp Asn Asp Gly

15 580 585 590

Ala Ile Leu Gly Phe Val Asn Lys Gin Gin Ala His Asp Leu Leu Ile

595 600 605

20

Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile

610 615 620

25

Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Pro Asp Arg Asn Leu

625

630

635

640

Trp Asn Leu Lys Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu

5

645

650

655

Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp

10

660

665

670

Arg Pro Lys Asp Glu Val Phe Ala Lys Tyr Tyr Thr Pro Val Leu Ala

675

680

685

15

Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile Lys Gln Val Val Pro

690

695

700

20 Glu Phe Val Asn Ala Phe Thr Asp Ala Gly Ala Ser Ala Thr Tyr Met

705

710

715

720

Asp Gln Ala Pro Ser Pro Val Val Cys Pro Gln Pro His Tyr Asn Met

25

725

730

735

Tyr Pro Pro Asn Pro Asp Pro Val Leu Asp Gln Asp Gly Glu Phe Asp

740

745

750

5

Leu Asp Glu Ser Met Asp Val Ala Arg His Val Glu Glu Leu Leu Arg

755

760

765

10 Arg Pro Met Asp Ser Leu Asp Ala Arg Leu Ser Pro Pro Ala Gly Leu

770

775

780

Phe Thr Ser Ala Arg Ser Ser Leu Ser

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<220>

<223> consensus

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<400> 11

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25

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<212> DNA

<213> Artificial

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10 <221> CDS

<222> (1)..(2382)

<223>

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Met Ala Gly Trp Ile Gln Ala Gln Gln Leu Gln Gly Asp Ala Leu Arg

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5

10

15

cag atg caa gtg ttg tat ggg cag cat ttc ccc atc gag gtc cgg cac 96

20 Gln Met Gln Val Leu Tyr Gln His Phe Pro Ile Glu Val Arg His

20

25

30

tac ctg gcc cag tgg atc gag agc cag ccg tgg gat gct att gac ttg 144

Tyr Leu Ala Gln Trp Ile Glu Ser Gln Pro Trp Asp Ala Ile Asp Leu

25

35

40

45

gat aat ccc cag gac cga ggt cag gcc acc caa ctc ctg gag ggc ctg 192
Asp Asn Pro Gin Asp Arg Gly Gin Ala Thr Gin Leu Leu Glu Gly Leu
50 55 60

5 gtg cag gag ctg cag aag aag gcg gag cac cag gtg ggg gaa gat ggg 240
Val Gin Glu Leu Gin Lys Lys Ala Glu His Gin Val Gly Glu Asp Gly
65 70 75 80

ttt ttg ctg aag atc aag ctg ggg cac tat gcc aca cag ctc cag aac 288
10 Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gin Leu Gin Asn
85 90 95

acg tat gac cgc tgt ccc atg gag ctg gtt cgc tgt atc cgt cac att 336
Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile
15 100 105 110

ctg tac aac gaa cag agg ctg gtt cgc gaa gcc aac aat tgc agc tcc 384
Leu Tyr Asn Glu Gin Arg Leu Val Arg Glu Ala Asn Asn Cys Ser Ser
115 120 125

20 cct gct ggt gtc ctg gtt gac gcc atg tcc cag aag cac ctt cag atc 432
Pro Ala Gly Val Leu Val Asp Ala Met Ser Gin Lys His Leu Gin Ile
130 135 140

25 aac caa agg ttt gag ggg ctg cgc ctg atc aca cag gac acg gag aac 480
Asn Gin Arg Phe Glu Gly Leu Arg Leu Ile Thr Gin Asp Thr Glu Asn

145	150	155	160	
gag ctg aag aag ctg cag cag acc caa gag tac ttc atc atc cag tac				528
Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr				
5	165	170	175	
cag gag agc ctg cgg atc caa gct cag ttt gcc cag ctg ggc cag ctg				576
Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu				
10	180	185	190	
aac ccc cag gag cgc atg agc agg gag acg gcc ctc cag cag aag caa				624
Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln				
15	195	200	205	
gtg tcc ctg gag acc tgg ctg cag cga gag gca cag aca ctg cag cag				672
Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln				
20	210	215	220	
tac cga gtg gag ctg gct gag aag cac cag aag acc ctg cag ctg ctg				720
Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu				
25	225	230	235	240
cgg aag cag cag acc atc atc ctg gac gac gag ctg atc cag tgg aag				768
Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys				
25	245	250	255	

cg~~g~~ aga cag cag ctg gcc ggg aac ggg ggt ccc ccc gag ggc agc ctg 816
Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu
260 265 270

5 gac gtg ctg cag tcc tgg tgt gag aag ctg gcc gag atc atc tgg cag 864
Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln
275 280 285

10 aac cgg cag cag atc cgc agg gct gag cac ctg tgc cag cag ctg ccc 912
Asn Arg Gln Gln Ile Arg Arg Ala Glu His Leu Cys Gln Gln Leu Pro
290 295 300

15 atc cca ggc ccc gtg gag gag atg ctg gct gag gtc aac gcc acc atc 960
Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile
305 310 315 320

20 acg gac atc atc tca gct ctg gtc acc agc acg ttc atc atc gag aag 1008
Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys
325 330 335

25 cag cct cct cag gtc ctg aag acc cag acc aag ttt gcg gcc acc gtg 1056
Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val
340 345 350

Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln 1104

	355	360	365	
	gtg aag gcg acc atc atc agc gag cag cag gcc aag tcc ctg ctc aag			1152
	Val Lys Ala Thr Ile Ile Ser Glu Gln Gln Ala Lys Ser Leu Leu Lys			
5	370	375	380	
	aat gag aac acc cgc aat gag tgc agc ggc gag atc ctg aac aac tgt			1200
	Asn Glu Asn Thr Arg Asn Glu Cys Ser Gly Glu Ile Leu Asn Asn Cys			
	385	390	395	400
10				
	tgc gtc atg gag tac cac cag gcc act ggc acg ctc agc gcc cac ttc			1248
	Cys Val Met Glu Tyr His Gln Ala Thr Gly Thr Leu Ser Ala His Phe			
	405	410	415	
15	aga aac atg tca ctg aaa aga atc aag cgc gcc gac agg cgt ggt gca			1296
	Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala			
	420	425	430	
	gag tcg gtg acg gag gag aag ttc aca gtc ctg ttt gag tct cag ttc			1344
20	Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gln Phe			
	435	440	445	
	agc gtt ggc agc aac gag ctg gtg ttc cag gtg aag acc ctg tcc ctc			1392
	Ser Val Gly Ser Asn Glu Leu Val Phe Gln Val Lys Thr Leu Ser Leu			
25	450	455	460	

cct gtg gtc gtt atc gtc cat ggc agc cag gac cac aat gct act gcc 1440
Pro Val Val Val Ile Val His Gly Ser Gin Asp His Asn Ala Thr Ala
465 470 475 480

5 acc gtg ctg tgg gac aat gcc ttt gct gag ccg ggc agg gtg cca ttt 1488
Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe
485 490 495

gct gtg cct gac aag gtg ctg tgg ccg cag ctg tgt gaa gcg ctc aac 1536
10 Ala Val Pro Asp Lys Val Leu Trp Pro Gin Leu Cys Glu Ala Leu Asn
500 505 510

atg aaa ttc aag gct gaa gta cag agc aac ccg ggc ttg acc aaa gag 1584
Met Lys Phe Lys Ala Glu Val Gin Ser Asn Arg Gly Leu Thr Lys Glu
15 515 520 525

aac ctc gtg ttc ctg gca cag aaa ctg ttc aac atc agc agc aac cac 1632
Asn Leu Val Phe Leu Ala Gin Lys Leu Phe Asn Ile Ser Ser Asn His
530 535 540

20 ctc gag gac tac aac agc atg tct gtg tcc tgg tcc cag ttc aac ccg 1680
Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gin Phe Asn Arg
545 550 555 560

25 gag aac ttg ccc ggc tgg aac tac acc ttc tgg cag tgg ttc gac ggg 1728
Glu Asn Leu Pro Gly Trp Asn Tyr Thr Phe Trp Gin Trp Phe Asp Gly

	565	570	575	
	gtg atg gag gtg ctg aag aag cac cat aag ccc cat tgg aat gat ggg			1776
	Val Met Glu Val Leu Lys Lys His His Lys Pro His Trp Asn Asp Gly			
5	580	585	590	
	gct atc ctg ggt ttc gtg aac aag caa cag gcc cac gac ctg ctc atc			1824
	Ala Ile Leu Gly Phe Val Asn Lys Gin Gin Ala His Asp Leu Leu Ile			
	595	600	605	
10				
	aac aag ccg gac ggg acc ttc ctg ctg cgc ttc agt gac tcg gaa atc			1872
	Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile			
	610	615	620	
15	ggg ggc atc acc att gct tgg aag ttt gac tct ccg gac cga aac ctc			1920
	Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Pro Asp Arg Asn Leu			
	625	630	635	640
	tgg aat ctg aag cca ttc acg acg cga gat ttc tcc att cgg tcc ctg			1968
20	Trp Asn Leu Lys Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu			
	645	650	655	
	gcc gac cgg ctg ggg gac ctg aac tac ctt atc tac gtg ttc cca gac			2016
	Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp			
25	660	665	670	

cga ccc aag gac gag gtc ttt gcc aag tat tac act cct gta ctt gcg 2064
Arg Pro Lys Asp Glu Val Phe Ala Lys Tyr Tyr Thr Pro Val Leu Ala
675 680 685

5 aaa gca gtt gac gga tac gtg aag cca cag atc aag caa gtg gtc cct 2112
Lys Ala Val Asp Gly Tyr Val Lys Pro Gln Ile Lys Gln Val Val Pro
690 695 700

gag ttc gtc aat gca ttc aca gat gcc gga gcc agc gcc acc tac atg 2160
10 Glu Phe Val Asn Ala Phe Thr Asp Ala Gly Ala Ser Ala Thr Tyr Met
705 710 715 720

gac cag gct cct tcc cca gtc gtg tgc cct caa cct cac tac aac atg 2208
Asp Gln Ala Pro Ser Pro Val Val Cys Pro Gln Pro His Tyr Asn Met
15 725 730 735

tac cca ccc aac cct gac cct gtc ctt gac caa gat ggc gag ttt gac 2256
Tyr Pro Pro Asn Pro Asp Pro Val Leu Asp Gln Asp Gly Glu Phe Asp
740 745 750

20 ctg gat gag agc atg gat gtt gcc agg cac gtg gaa gaa ctt tta cgc 2304
Leu Asp Glu Ser Met Asp Val Ala Arg His Val Glu Glu Leu Leu Arg
755 760 765

25 cgg ccc atg gac agt ctc gac gcc cgc ctc tcc cca cct gct ggt ctc 2352
Arg Pro Met Asp Ser Leu Asp Ala Arg Leu Ser Pro Pro Ala Gly Leu

770

775

780

ttc acc tcc gct aga agc tcc ctg tcc tga

2382

Phe Thr Ser Ala Arg Ser Ser Leu Ser

5 785

790

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10 <212> PRT

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Gln Met Gln Val Leu Tyr Gly Gin His Phe Pro Ile Glu Val Arg His

20

20

25

30

Tyr Leu Ala Gln Trp Ile Glu Ser Gin Pro Trp Asp Ala Ile Asp Leu

35

40

45

25

Asp Asn Pro Gln Asp Arg Gly Gln Ala Thr Gln Leu Leu Glu Gly Leu

50 55 60

5 Val Gln Glu Leu Gln Lys Ala Glu His Gln Val Gly Glu Asp Gly

65 70 75 80

Phe Leu Leu Lys Ile Lys Leu Gly His Tyr Ala Thr Gln Leu Gln Asn

10 85 90 95

Thr Tyr Asp Arg Cys Pro Met Glu Leu Val Arg Cys Ile Arg His Ile

100 105 110

15

Leu Tyr Asn Glu Gln Arg Leu Val Arg Glu Ala Asn Asn Cys Ser Ser

115 120 125

20

Pro Ala Gly Val Leu Val Asp Ala Met Ser Gln Lys His Leu Gln Ile

130 135 140

25 Asn Gln Arg Phe Glu Gly Leu Arg Leu Ile Thr Gln Asp Thr Glu Asn

145 150 155 160

Glu Leu Lys Lys Leu Gln Gln Thr Gln Glu Tyr Phe Ile Ile Gln Tyr

165 170 175

5

Gln Glu Ser Leu Arg Ile Gln Ala Gln Phe Ala Gln Leu Gly Gln Leu

180 185 190

10

Asn Pro Gln Glu Arg Met Ser Arg Glu Thr Ala Leu Gln Gln Lys Gln

195 200 205

15 Val Ser Leu Glu Thr Trp Leu Gln Arg Glu Ala Gln Thr Leu Gln Gln

210 215 220

Tyr Arg Val Glu Leu Ala Glu Lys His Gln Lys Thr Leu Gln Leu Leu

20 225 230 235 240

Arg Lys Gln Gln Thr Ile Ile Leu Asp Asp Glu Leu Ile Gln Trp Lys

245 250 255

25

Arg Arg Gln Gln Leu Ala Gly Asn Gly Gly Pro Pro Glu Gly Ser Leu

260

265

270

5 Asp Val Leu Gln Ser Trp Cys Glu Lys Leu Ala Glu Ile Ile Trp Gln

275

280

285

Asn Arg Gln Gln Ile Arg Arg Ala Glu His Leu Cys Gln Gln Leu Pro

10

290

295

300

Ile Pro Gly Pro Val Glu Glu Met Leu Ala Glu Val Asn Ala Thr Ile

15

305

310

315

320

Thr Asp Ile Ile Ser Ala Leu Val Thr Ser Thr Phe Ile Ile Glu Lys

325

330

335

20

Gln Pro Pro Gln Val Leu Lys Thr Gln Thr Lys Phe Ala Ala Thr Val

340

345

350

25

Arg Leu Leu Val Gly Gly Lys Leu Asn Val His Met Asn Pro Pro Gln

355

360

365

Val Lys Ala Thr Ile Ile Ser Glu Gin Gin Ala Lys Ser Leu Leu Lys

5 370

375

380

Asn Glu Asn Thr Arg Asn Glu Cys Ser Gly Glu Ile Leu Asn Asn Cys

385

390

395

400

10

Cys Val Met Glu Tyr His Gin Ala Thr Gly Thr Leu Ser Ala His Phe

405

410

415

15

Arg Asn Met Ser Leu Lys Arg Ile Lys Arg Ala Asp Arg Arg Gly Ala

420

425

430

20 Glu Ser Val Thr Glu Glu Lys Phe Thr Val Leu Phe Glu Ser Gin Phe

435

440

445

Ser Val Gly Ser Asn Glu Leu Val Phe Gin Val Lys Thr Leu Ser Leu

25 450

455

460

Pro Val Val Val Ile Val His Gly Ser Gin Asp His Asn Ala Thr Ala

465

470

475

480

5

Thr Val Leu Trp Asp Asn Ala Phe Ala Glu Pro Gly Arg Val Pro Phe

485

490

495

10 Ala Val Pro Asp Lys Val Leu Trp Pro Gin Leu Cys Glu Ala Leu Asn

500

505

510

Met Lys Phe Lys Ala Glu Val Gin Ser Asn Arg Gly Leu Thr Lys Glu

15

515

520

525

Asn Leu Val Phe Leu Ala Gin Lys Leu Phe Asn Ile Ser Ser Asn His

530

535

540

20

Leu Glu Asp Tyr Asn Ser Met Ser Val Ser Trp Ser Gin Phe Asn Arg

545

550

555

560

25

Glu Asn Leu Pro Gly Trp Asn Tyr Thr Phe Trp Gin Trp Phe Asp Gly

565

570

575

Val Met Glu Val Leu Lys Lys His His Lys Pro His Trp Asn Asp Gly

5 580 585 590

Ala Ile Leu Gly Phe Val Asn Lys Gin Gin Ala His Asp Leu Leu Ile

595 600 605

10

Asn Lys Pro Asp Gly Thr Phe Leu Leu Arg Phe Ser Asp Ser Glu Ile

610 615 620

15

Gly Gly Ile Thr Ile Ala Trp Lys Phe Asp Ser Pro Asp Arg Asn Leu

625 630 635 640

20 Trp Asn Leu Lys Pro Phe Thr Thr Arg Asp Phe Ser Ile Arg Ser Leu

645 650 655

Ala Asp Arg Leu Gly Asp Leu Asn Tyr Leu Ile Tyr Val Phe Pro Asp

25 660 665 670

Arg Pro Lys Asp Glu Val Phe Ala Lys Tyr Tyr Thr Pro Val Leu Ala

675

680

685

5

Lys Ala Val Asp Gly Tyr Val Lys Pro Gin Ile Lys Gin Val Val Pro

690

695

700

10 Glu Phe Val Asn Ala Phe Thr Asp Ala Gly Ala Ser Ala Thr Tyr Met

705

710

715

720

Asp Gin Ala Pro Ser Pro Val Val Cys Pro Gin Pro His Tyr Asn Met

15

725

730

735

Tyr Pro Pro Asn Pro Asp Pro Val Leu Asp Gin Asp Gly Glu Phe Asp

740

745

750

20

Leu Asp Glu Ser Met Asp Val Ala Arg His Val Glu Glu Leu Leu Arg

755

760

765

25

Arg Pro Met Asp Ser Leu Asp Ala Arg Leu Ser Pro Pro Ala Gly Leu

770

775

780

Phe Thr Ser Ala Arg Ser Ser Leu Ser

5 785

790